Joint E3 Bulletin

JOINT E3 BULLETIN

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Joint Service Ordnance E3 Program

The Joint Service Ordnance E3 Program provides support to the Warfighting CINCs, Joint Task Force Commanders, and Joint Operational Planners, as well as addresses joint ordnance acquisition issues.

The following provides some examples of the issues being worked by the Joint Service Ordnance E3 Program.

CINC/JTF OPERATIONAL HERO GUIDANCE

The primary goal of the Joint Ordnance E3 Program is to collect, develop, and provide the data needed by operational commanders and planners to safely and efficiently manage any conflict between ordnance and radio frequency (RF) emitters employed in an integrated joint operation/ exercise. With this information, the warfighter can make informed decisions regarding the risk associated with the use (or non-use) of certain emitters and/or ordnance items.

JOINT ORDNANCE E3 RISK ASSESSMENT DATABASE (JOERAD)

Development of JOERAD began three years ago with the hazards of electromagnetic radiation to ordnance (HERO) susceptibility module. JOERAD presently consists of the following four modules: the Susceptibility Module, Equipment Characteristics (EC) Module, Operational Platform Module, and the Integration Module. The Susceptibility Module contains DODIC, NSN, Part Number, Ordnance Name, Nomenclature/ Description, Platform, Launchers, Handling Equipment, Associated Cabling, References (such as the Cognizant Activity, Documentation, and Test Dates), EID information, and the Maximum Allowable Environment (MAE) for all known DoD ordnance items.

There are three types of records in the Equipment Characteristics Module: system, component (emitter), and antenna records. System records are complex or unitary and contain major specifications about the system. Component records contain parameters of emitters contained in the system. Antenna records contain specifications of antennas that may be connected to the systems. The Integration Module performs the mathematical calculations and provides the HERO impact assessment.

JOERAD (with the Susceptibility, Equipment Characteristics, and Integration Modules) is currently undergoing final user testing by the service HERO technical community.

The Operational Platform Module has been completed and is currently undergoing user testing. When the Operational Platform is populated with operational platform data it will contain detailed information regarding the emitter suites assigned to land, sea, and air platforms.

JOERAD is expected to be ready for distribution to the operating forces during the second quarter of fiscal year 2000.

ANALYZE HERO IMPACT OF UNIT AMMUNITION BASIC LOADS

Many of the critical operational impact decisions that are required for an integrated joint operation involve assessing the conflict between “known normal ordnance items” and “known normal emitter suites.” JSC has been collecting data related to the standard, non-standard, and special-purpose munitions and emitters used by various operational units for evaluation. Various HERO impact assessments have been prepared which will allow these forces to plan for the best ordnance/emitter pairs to be used during an operation, identify those pairs in conflict, and develop “work arounds” to mitigate conflicts.

HERO TEST METHODOLOGY STANDARD

JSC, in concert with the Joint Ordnance Commanders Group, has developed a HERO test methodology guide that will (as a minimum) outline the methodology that is required when considering an ordnance item with a joint mission. Also, the methology can be used by the individual services to standardize HERO T&E.

Although intended primarily for use by DoD HERO test activities, the guide also provides a consolidation of “corporate knowledge” about the subject and should be of interest to procuring authorities and system developers.

The draft joint methodology test guide is currently under review by the HERO technical community and is expected to be ready for service review during the second quarter of FY00.

The Joint Service Ordnance E3 Program Manager is Mr. William “Bill” Lenzi. For more information regarding the program, please contact Bill at lenzi@jsc.mil.

Explosive Foil Initiator (EFI) Characterization Standards

Using technology borrowed from Nuclear Weapon programs, the EFI is a type of Electro-Explosive Initiator designed to be insensitive to most E3 environments. Lightning, EMP, P-static and so forth.

EFIs are becoming widely used by Army weapon developers because they are becoming low powered, smaller in size, cheaper to make and easier to implement inside weapon systems.

EFIs are also know as Chip Slapper Detonators or Explosive Bridge-Wires(EBWs), etc.

EFIs fire by discharging a capacitor (charged to several thousands of volts) across its bridgewire. The energy absorbed by the bridgewire causes it to evaporate. The particles from the reaction impact's a secondary explosive causing it detonate.

Representatives of the three Services, as well as the UK, met at Indian Head, MD on the 20th of July 1999 to discuss the proper way to characterized these devices.

STANAG 4560 provides a listing of test requirements for the characterization of EEDs, and specifically EFIs, EBWs, etc. The US would like to use this data as part of a typical qualification test for an EED at either the component, subassembly or fuze or other end item level. (Characterization is not qualification.) The STANAG also provides background information and describes test methodologies and provides suggested test parameters, where applicable, for these tests.

The latest versions of MIL-STD-331, STANAG Test G1, Draft STANAG 4560 v4, and the draft of the 4560 AOP can be found at the following web page:

http://w3.pica.army.mil/techtran/opportun/pd+e3/EFI%20Page.htm

Due to the fact that there were a lot of action items generated from the last meeting at Indian Head, any changes to the above documents will be published as soon as the members make them available. Minutes of the meeting will also be provided at the above web site.

Manufacturers of these devices or Government organizations that work or evaluate EFIs are welcomed to provide comments on the standards to Mr. D. Gutierrez. The above documents will eventually dictate how EFIs will be tested and what type of equipment is needed to perform these tests.

POC for this article is Mr. Daniel O. Gutierrez, 973-724-4667; fax (973) 724-5581 or dgutierr@pica.army.mil.

Results of NAVAIR Progress Review

The annual NAVAIR E3 Progress Review, sponsored by the NAVAIR E3 Engineering Division, AIR-4.1.7, was held 18-20 May 1999 at the Waterside Sheraton Hotel in Norfolk, Va. The Review featured E3 related technical presentations and speakers from all facets of the military and industry. The Norfolk location also afforded unprecedented participation by Fleet representatives involved in operational E3 matters.

The first day was devoted largely to presentations providing organizational initiatives and updates. CNO, the Navy's Systems Commands, the Army, the Joint Spectrum Center, and the Naval Electromagnetic Spectrum Center provided corporate perspectives and E3 program status reports. Dave Bassett from the US Army Research Laboratory spoke of the Army's E3 challenge and the Army's transformation to the digitized battlefield of the future. Scott Hoschar from NAVEMSCEN provided a "Big Picture" look at Spectrum Management dispelling many long-held myths.

Ed Fabeny provided a status from the CNO perspective; Mike Stewart covered E3 activities at SPAWAR; Mike Daniele summarized current state of E3 NATO events; Ken Deans highlighted the progress and plans for AMITS; Robert Smith clarified the intent and value of NVLAP-accreditation; and Matt Grenis spoke about current initiatives from NAVAIR's E3 Engineering Division, and provided an update on ASEMICAP and its elements from a budgetary perspective.

The NAVAIR E3 Progress Review was well represented by the Fleet. Representing CNAL and CNAP, LtCol Ron Ellinger spoke about the TYCOM's roles in supporting ASEMICAP and other E3 initiatives, including EMI and ESD training successes and concerns. LtCol Ellinger provided recommended engineering investigations, and also elaborated on engineering proposals to ensure program improvement, including effective on-site engineering support.

(Continued on page 4)

E3 Personality of the Quarter

Call for Papers

The 2000 DoD E3 Program Review is scheduled for the week of 10 April 2000 at the Omni-Rosen Hotel in Orlando, FL.

If you wish to present a paper at the 2000 DoD E3 Program Review, please forward a 50-word abstract to the appropriate point of contact by 7 December 1999. Topics for presentations may include, but are not limited to, the following:

- Acquisition Reform
- Automated E3 Tools
- E3 Community Organization
- RADHAZ
- E3 Specifications and Standards
- Acquisition Strategy
- Spectrum Management
- Measurement Techniques
- Case Study Results
- Operational E3

Points of Contact

OSD/Joint Staff/Industry

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Marine Corps

Mr. Praful Bharucha
E-mail: ..... bharuchapt@mscs.usmc.mil

Navy

Mr. Joe Juras
E-mail: ..... jurasjw@hq.navsea.navy.mil

Industry

Mr. George C. Johnson
E-mail: ..... gjohnson@iitri.org

NAVAIR ..... Continued from page 2

CNARF TYCOM, CAPT Don Evans, represents the newest ASEMICAP training initiative: expanding ASEMICAP's EMI training to the Reserves. CAPT Evans provided an insightful overview of the Reserves and an enthusiastic look ahead for ASEMICAP and the Fleet.

The second day featured more technical presentations, including updates of the V-22 and F/A-18 E3 program efforts, the new MIL-STD-461E, the 3rd Civilian GPS Signal Selection, presentations on the use of commercial items from both industry and NAVAIR, spread spectrum testing and more. The technical presentations were well received by all attendees.

The final day of the conference set aside time for training sessions and for ASEMICAP meetings. The training sessions were Spectrum Regulatory Agencies & Processes and Intro to Design and Test for E3 Requirements. The ASEMICAP meetings held were the Hardness Board meeting and the Air Industrial EMC Board.

For additional information on this or upcoming conferences, or on NAVAIR E3 programs, contact Matthew Grenis at (301) 757-2360.

FREE IMMEDIATE ONLINE ACCESS TO MILSPECS and STD5 - REGISTRATION or PASSWORD NO LONGER REQUIRED

Thanks to a much improved Defense Standardization Program Web Site, www.dsp.dla.mil , all Government and Industry customers now have immediate, free access to Defense specifications and standards. Users simply click on "SPECS&STDS", and they are led to a DTIC document search screen, on which they enter the document information (e.g., number or title). The "hits" are then displayed, and the user selects the desired document. If it's a Military Spec or Std, the ASSIST-Enterprise screen is then displayed, allowing the user to click on the selected document's icon. The user then views a full text version of the document in Adobe PDF, which can be downloaded and printed.

Change of Address for Joint Spectrum Center

Effective immediately, the new Address for the Joint Spectrum Center is as follows:

DOD Joint Spectrum Center
2004 Turbot Landing
Annapolis, MD 21402-5064

IITRI Acquires R&B Enterprises

In August 1999, IITRI announced the acquisition of EMC Science Center, Inc., T/A R&B Enterprises. Headquartered in West Conshohocken, PA, R&B is recognized worldwide for its work in the electromagnetic engineering field. Past R&B successes include training electromagnetic engineering effects (E3) specialists for both government and private industry, and contributing to the development of electromagnetic compatibility (EMC) standards.

R&B brings to IITRI a certified EMC testing laboratory, well-proven training programs, and extensive technical expertise in E3 testing. IITRI will apply its business development practices and resources to increase R&B's growth rate.

Much of the anticipated growth will occur through expanded support to the commercial transportation industry in areas such as automotive testing. "R&B is the first independent laboratory to be certified by DaimlerChrysler Corporation to provide component EMC testing for more than 200 suppliers of automobile components to Chrysler " said IITRI's Group Senior Vice President Randy Crawford. Randy added that IITRI hopes to explore similar relationships with other auto manufacturers, capturing a significant role in the automotive EMC testing market.

The acquisition also strengthens IITRI's presence in the Department of Defense and military EMC services sectors. R&B's established military client base in the U.S. Navy will expand IITRI's Navy business base and complement IITRI's work with the U.S. Air Force and U.S. Army.

R&B will become an operation managed by Charles Gettier in the Spectrum Engineering Group. "Through this acquisition," said Randy "we see an opportunity to supply broad-based EM-related consulting, testing and certification service to the military and to the commercial aircraft and automobile industries, the medical community, educational institutions, and other U.S. and foreign commercial markets."

The acquisition of R&B by IITRI excludes the assets of ROBAR Industries and the associated ITEM publications, which will continue under the ownership of Robert D. Goldblum, former President of R&B.

RESULTS OF MODE-STIRRED ANECHOIC CHAMBER & OATS USERS MEETING

A meeting of the Mode-Stirred, Anechoic Chamber, and Open Area Test Site (OATS) Users was held June 7-9, 1999 at the Northbrook Hilton, Northbrook Illinois and was hosted by Underwriters Laboratories (UL) and Lindgren RF Enclosures. Twenty-two papers were presented which addressed reverberation, anechoic chambers and OATS test methodologies.

The meeting began on Monday afternoon, June 7 with a half-day tutorial/workshop on reverberation chamber statistics by John Ladbury and Gus Freyer. Tuesday and Wednesday, June 8 & 9, featured technical presentations and a tour of the extensive UL EMC Test Facilities. The "Best Paper Award" went to Mr. Olaf Lundun for his paper "Some Measurements of Stirrer Efficiency in Mode-Stirred Chambers".

The meeting attracted more than 70 people including 9 attendees from Australia, Italy, Sweden and the United Kingdom. The tentative time frame for the next meeting has been identified as late 2000 or early 2001.

This meeting was the latest in a series of meetings that started a number of years ago. The first meeting of the reverberation chamber users group was sponsored by the National Institute of Standards and Technology and was held in August 1991 at the Boulder Courtyard in Boulder Colorado. Subsequent meetings were merged with the Anechoic Chamber users group which held meetings at Eglin AFB in 1990 and Rome Air Development Center in 1991. The first, combined meeting was held in November 1992 at the Naval Surface Warfare Center, Dahlgren Virginia. Following meetings were held in May 1994 at the NASA Langley Research Center, Hampton Virginia, in December 1995 at the Naval Surface Warfare Center, Dahlgren Virginia, and in April/May 1997 at Vail Colorado (NIST Sponsored). The goal of each meeting was, and still is, the timely exchange of technical information related specifically to mode-stirred, anechoic chamber and OATS test methodologies. While the theoretical is addressed, the practical "user" point of view is stressed. "Pioneers" at the first meeting who remain actively involved today include Galen Koepke and John Ladbury from the National Institute of Standards and Technology, Michael O. Hatfield of the Naval Surface Warfare Center and Diane R. Kempf of the Naval Air Warfare Center. This meeting retains its reputation as a critical "think-tank" to the EMC industry, and specifically to mode-stirred, anechoic chamber and OATS test methodologies, which is conservatively estimated to be a multi-billion dollar industry worldwide. Also, as "quiet" test areas diminish globally and commercial and government industries face increased competitive pressure to do things "faster and cheaper", these meetings provide the forum for all involved to share information to better address industry challenges.

(Contributed by Mr. Mike Hatfield, NSWCDD, Dahlgren, VA, tel: 540-653-3451, hatfieldmo@nswc.navy.mil)

CONFERENCE INFORMATION

All those who will be attending the DoD E3 Program Review being held in Orlando, Florida from 10-14 April 2000 will have a pleasant surprise. For the first time the NAVAIR E3 Program Review and the NICG Lightning Conference will be held in conjunction with the DoD conference at the same location, Omni-Rosen Hotel. This will allow for attendees of the different conferences to assemble at the same time and to have a broader audience for the exchange of information. Every effort is being made to avoid any conflicts of presentations at the conference.

The registration fee will be $245.00. The fee pays for costs of meeting breaks, materials, the luncheon, no-host cocktail hors d'oeuvre selections, the banquet, attendance at two training courses, and the proceedings on compact disc.

We look forward to seeing you all in Orlando, Fl. for the Y2K annual conference. Also we have a call for papers out and solicit papers from you that will help the community to stay on the top of the power curve regarding topics, such as: advances in technology, newly developed E3/SM design tools, enhancements to the acquisition process and advancements in testing and measurement techniques, etc.

Spectrum Certification and Frequency Assignments

There have been an increasing number of incidents pertaining to the development, acquisition, and fielding of spectrum dependent equipment that has not received spectrum certification and frequency assignments. Failure to perform these required processes increases the chances that new equipment will not be compatible with existing communication-electronic (C-E) systems already operating in the electromagnetic environment Additionally, failure to obtain host nation authority eliminates the possibility of a C-E system being able to support the warfighter or perform its mission on foreign soil. The purpose of this article is to reiterate program manager development community and acquisition agent responsibilities in supporting and completing spectrum certification and frequency assignments requirements.

Increasing demands on the radio frequency spectrum, to support emerging technology services and capabilities create spectrum congestion, increase the potential for degraded services and harmful interference, and ultimately impact the goal of providing C4I spectrum support for the warfighter. Shortened acquisition cycles, a greater reliance on wireless technology, and a change in the nature of military operations have placed greater reliance on the acquisition and deployment of commercial items (CI). Additionally, spectrum certification and frequency assignment information (DD 1494 data & FRRS/GMF) is part of a large DoD database used extensively to defend the DoD's current and future use of the electromagnetic spectrum from encroachment and spectrum reallocation via spectrum auctions mandated by Congress. All of the reasons and mitigating factors stated above emphasize the necessity and importance of obtaining spectrum certification and frequency assignments.

The purpose of the spectrum certification process is to ensure that; (1) the operational frequency band(s) and type of services (i.e. maritime mobile, radiolocation, etc.) are in conformance with respective national and international tables of frequency allocations; (2) the equipment conforms to applicable standards, specifications, regulations, directives and statutes, and (3) authorize expenditure of funds for the procurement/development of RF dependent equipment.

All spectrum dependent equipment/systems owned and operated by the DoD whether NDI, ACTD, Dual-Use, and/or unlicensed PCS requires certification and assignment by the United States Military Communication Electronics Board (USMCEB) Frequency Panel's (FP) J-12 Permanent Working Group (PWG) and/or the National Telecommunications and Information Administration (NTIA) Spectrum Planning Subcommittee (SPS) as appropriate. In simplistic terms, if it emits energy into the environment, you must prepare and submit a DD1494 for consideration. A type acceptance by the FCC for commercial equipment is not acceptable for any military use (exception - Part 15/NTIA Annex K devices, i.e. extremely low power for US & P use only). In some cases, CI being considered for acquisition and procurement by the Military operate only in exclusive non-government frequency bands. In the US, the EM spectrum is divided into different frequency bands which are allocated (set aside) between the government and the non-government users. While most frequency bands are shared, some are not. Military operations in exclusive non-Government spectrum often means the military will not be permitted to use the procured CI in the US&P, or at a minimum will be on a noninterference basis (NIB) and probably suffer significant operating restrictions. Additionally, each nation outside the US & P controls the use of the EM spectrum within its territory and may allocate the spectrum differently than the US. This often means that CI can face difficulties in obtaining host nation spectrum support.

It is important to note that an approved DD1494, the application for equipment frequency allocation, is not an approval or authorization for use of specific frequencies. A frequency assignment must be obtained through the proper authorities prior to equipment/system activation. However, without an approved DD1494, or spectrum certification, no frequency assignment can be authorized. All spectrum dependent equipment (including FCC Part 15 and NTIA Annex K devices) being fielded overseas (US&P) require appropriate CINC coordination with the host nation, and specific host nation supportability comments/authorization.

Developers and acquirers must ensure electromagnetic compatibility for deployed equipment. Program Managers, the DoD development community and acquisition agents must plan and program for the use of the EM spectrum to ensure successful integration of the RF dependent equipment into the operating force. The service spectrum management offices are committed to supporting this effort and maintains, or has access to, the resources required to asses the spectrum supportability of RF dependent equipment being developed and/or acquired by the DoD. It is clear that wireless technology that is spectrum supportable, will be the enabler for transitioning the DoD into the 21st Century.

Please contact the following offices for additional information or guidance.

Army SMO, C-E Services (703) 325-8226

Air Force SMO, Air Force Frequency Management Agency, AFFMA (703) 428-1509

Navy SMO, Naval Electromagnetic Spectrum Center, NAVEMSCEN (703) 325-2833.

(Contributed by Mr. Scott A. Hoschar, DSN221-2833, (703) 325-2833, hoschars@navemscen.navy.mil)

MIL-STD 461E ISSUED

MIL-STD-461E, "DOD Interface Standard Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment" was published 20 August 1999. It consolidates MIL-STD-461D and MIL-STD-462D into one standard. Concurrently, the associated Data Item Descriptions (DIDs) listed below were issued.

DID NUMBER	DID TITLE
DI-EMCS-80199B	Electromagnetic Interference Control Procedures (EMICP)
DI-EMCS-80201B	Electromagnetic Interference Test Procedures (EMITP)
DI-EMCS-80200B	Electromagnetic Interference Test Report (EMITR)

A summary of changes in MIL-STD-461E from MIL-STD-461D/462D follows:

- EUT hardware and software must be representative of production. Susceptibility scan rates have been revised. The frequency of measurement system test checks has been revised.

- CS Requirements; CE101 is no longer applicable to shipboard equipment.

- CS Requirements;
  CS115 and CS 116 applicability have been revised for several equipment classes. CS 101 applicability and limit have been extended to 150 kHz. CS 109 and 116 measurement procedures have been revised. CS 114 limits have been revised.

- RE Requirements
  RE 101 requirement at 50 cm has been deleted; limit made more stringent. RE 102 limit for submarine equipment has been revised and depends on whether equipment is internal or external to the pressure hull.

- RS Requirements
  RS 101 limit has been revised for Navy applications and an alternative test using the Helmholtz coil has been added. RS 103 added use of mode-tuned reverberation chambers above 200 MHz. RS 105 limit has been revised to be consistent with IEC standards.

Additional changes are described in an article by Mr. John Zenter in the proceedings of the 1999 DoD E3 Program Review.

DSMC ELECTIVE ON E3 and SPECTRUM CERTIFICATION

The Joint Spectrum Center has developed a 3-hour elective course for the Defense Systems Management College, Ft. Belvoir, VA entitled "E3 and Spectrum Certification (SC) in the Acquisition Process". The course provides an introduction into the importance of E3 and SC, definitions, policies and directives the spectrum certification process and how to treat E3 and SC in acquisition process, including incorporating E3/SC into acquisition documents (e.g. MNS, ORDs, C4ISPs, TEMPs), T&E strategy and IPTs.

The course has been given twice, in March and July 1999, with approximately 15 people attending each session.

The next session is scheduled for 28 Oct 1999, with future plans to give this elective during each Advanced Program Management Course (APMC), typically 3 times per year.

In order to obtain as wide an audience as possible, the JSC will take the course to any Command or Agency desiring to host it. There will be no cost to the host activity; however, the host should ensure a minimum attendance of 15 program or acquisition management personnel.

(Point of contact for the course is Mr. Bill Lenzi, (410) 293-4957 ext 1821, e-mail: lenzi@jsc.mil)

CALENDAR

ATTENTION READERS

Send us details of your upcoming meeting, symposium or E3-related event and we will be happy to include them in the Joint E3 Bulletin calendar. Send your material to Joint E3 Bulletin, c/o Ms. Mary Grieco, R&B/ IITRI, 1 Crystal Park, Suite 903, Arlington, VA 22202, (703) 486-7023, Fax (703) 486-3477, E-mail: gjohnson@iitri.org.

1999

October 18-19, 1999
IEEE STANDARD COORDINATING COMMITTEE SCC-28 (NON-IONIZING RADIATION) in conjunction with IEEE (EM BIOMEDICAL SOCIETY) EMBS MEETING
Atlanta, GA
POC: Dr. John Osepchuk
Tel.: (978) 287-5849
Fax: (978) 318-9303
E-mail: j.m.osepchuk@ieee.org

November 1-4, 1999
1999 INTERNATIONAL CONFERENCE ON COMPUTATIONAL ELECTROMAGNETICS & ITS APPLICATIONS (ICCEA '99
Beijing, China
Information: Dayong Liu
Chinese Institute of Electronics
P.O. Box 165
Beijing 100036, China
E-mail: dyliu@public.bta.net.cn
Website: www.cie-china.org/iccea99.htm

November 2-4, 1999
EMC ASIA 99, 2ND INTERNATIONAL EXHIBITION ON ELECTROMAGNETIC COMPATIBILITY
Westin Stamford & Westin Plaza
Singapore
Information: MESAGO
Rotebuehlstrasse 83-85, D-170178
Stuttgart, Germany
+49 711 61946 32
Fax: +49 711 66197 32
http://www.mesago.de

December 7-9, 1999
1999 Joint Staff Spectrum Management Conference
Radisson Hotel
120 Holiday Court
Annapolis, MD
POC: Mr. Paul Vavrek
Tel: (DSN) 281-2326 or
(410) 293-2326
E-mail: vavrek@jsc.mil
Reservations: (800) 333-3333 or
(410) 224-3150

2000

February 22-24, 2000
EMV 2000
8th International Exhibition and Conference on Electromagnetic Compatibility (EMC)
Messe Dusseldorf
Stuttgart, Germany
POC: Daniela Bader
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Fax: +49-711-61946-98
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March 20-24 2000
HEART CONFERENCE
Anahiem, California
Disneyland Hotel
P.O.C: Wendland Beezhold
Tel: (505) 845-7511 (voice)
Fax: (505) 845-7553
E-Mail: wbeezho@sandia.gov

April 9-14, 2000
AP 2000 MILLENNIUM CONFERENCE ON ANTENNAS AND PROPAGATION
Davos, Switzerland
Contacts:
ESTEC Conference Bureau
NL 2200 AG Noordwijk, Netherlands
Tel.: +31 71 565-5005
Fax: +31 71 565-5658
E-mail: confburo@estec.esa.nl
or
A.G. Roederer (Conference Chair)
E-mail: aroedere@estec.esa.nl

April 10 - 14, 2000
2000 DOD E3 PROGRAM REVIEW
Omni-Rosen Hotel
Orlando, FL
Registration: Mr. George Johnson
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May 30 - June 2, 2000
EUROEM 2000
Scotland, UK
Information, Concorde Services Ltd,
Suite 325, Pentagon business Center,
Washington Street, Glasglow G3
BAZ Scotland, Uk
Tel:: +44 (0)141-221-5411
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E-mail: euroem@concorde-uk.com

August 21-25, 2000
2000 IEEE EMCS SYMPOSIUM
Washington, DC
Registration: Ms. Nathalie Gallet
Tel.: (301) 937-8888
Fax: (301) 937-2796
E-mail: ara@ara-inc.com

Joint E3 Bulletin Material Wanted

The Joint E3 Bulletin covers events and information of interest to the DoD E3 community. This includes technical articles, features on EMC personnel, training schedules and free courses available to DoD personnel, announcements of EMC standards activities, notes and full text articles on related policy and much more.

Articles and other relevant E3 material are now being solicited for publication in the Joint E3 Bulletin. The articles may be as described above, or may be in other forms, such as descriptions of problems, requests for technical data or information, interesting observations of E3 phenomena, E3 events announcements, or related material of interest. Obviously, all submitted material must be unclassified and unrestricted. Material should be sent to Ms. Mary Grieco, R&B/IITRI, 1 Crystal Park, Suite 903, Arlington, VA 22202. (703) 486-7023. Fax (703) 486-3477. E-mail: gjohnson@iitri.org.